

We Claim:

1. A transmitting and receiving unit, comprising:

first and second frequency generators;

a switch;

a receiving branch with an in-phase component and a quadrature component, said receiving branch having a first frequency converter coupled to said first frequency generator;

a transmitting branch with an in-phase component and a quadrature component, said transmitting branch having a second frequency converter switchably coupled to one of said first and second frequency generators through said switch; and

a control device coupled to said switch for selecting a transmitting mode of operation and a receiving mode of operation.

2. The transmitting and receiving unit according to claim 1, wherein:

said switch has switch positions;

said receiving branch has a radio frequency input;

said transmitting branch provides a radio frequency signal;

a second switch couples said transmitting branch and said receiving branch and switches said RF signal through to said RF input of said receiving branch dependent upon at least one of said switch positions; and

a control device is coupled to said second switch and drives said second switch.

3. The transmitting and receiving unit according to claim 2, wherein:

said transmitting branch has a radio frequency end;

said receiving branch has a radio frequency end; and

band-pass filters are respectively coupled to each of said radio frequency ends of said transmitting and receiving branches.

4. The transmitting and receiving unit according to claim 3, wherein said band-pass filters are surface acoustic wave filters.

5. The transmitting and receiving unit according to claim 1, wherein:

each of said transmitting and receiving branches have at least one low-pass filter with a switchable cut-off frequency; and

a control device is coupled to said at least one low-pass filter for driving said at least one low-pass filter.

6. The transmitting and receiving unit according to claim 1, further comprising:

a first digital signal processing device being connected downstream to said receiving branch with respect to a signal flow direction and having a low-pass filter with switchable filter coefficients at a receiving end; and

a second digital signal processing device being connected upstream to said transmitting branch with respect to a signal flow direction and having a low-pass filter with switchable filter coefficients at a transmitting end.

7. The transmitting and receiving unit according to claim 6, wherein each of said digital signal processing devices has a phase error compensation network.

8. The transmitting and receiving unit according to claim 7, further comprising a control device being connected to said phase error compensation networks and to said low-pass filters for driving said low-pass filters and said phase error compensation networks.

9. The transmitting and receiving unit according to claim 1, further comprising a reference frequency source commonly connected to said first and second frequency generators.

10. The transmitting and receiving unit according to claim 1, wherein said first and second frequency generators are each phase-locked loops having a local oscillator frequency set independently by divider ratios.

11. The transmitting and receiving unit according to claim 4, wherein:

each of said transmitting and receiving branches have at least one low-pass filter with a switchable cut-off frequency; and

a control device is coupled to said at least one low-pass filter for driving said at least one low-pass filter.

12. The transmitting and receiving unit according to claim 11, further comprising:

a first digital signal processing device being connected downstream to said receiving branch with respect to a signal flow direction and having a low-pass filter with switchable filter coefficients at a receiving end; and

a second digital signal processing device being connected upstream to said transmitting branch with respect to a signal flow direction and having a low-pass filter with switchable filter coefficients at a transmitting end.

13. The transmitting and receiving unit according to claim 12, wherein each of said digital signal processing devices has a phase error compensation network.

14. The transmitting and receiving unit according to claim 13, further comprising a control device being connected to said phase error compensation networks and to said low-pass filters for driving said low-pass filters and said phase error compensation networks.

15. The transmitting and receiving unit according to claim 14, further comprising a reference frequency source commonly connected to said first and second frequency generators.

16. The transmitting and receiving unit according to claim 15, wherein said first and second frequency generators are each phase-locked loops having a local oscillator frequency set independently by divider ratios.

17. A transmitting and receiving unit, comprising:

first and second frequency generators;

a switch;

a receiving branch with an in-phase component and a quadrature component, said receiving branch having a first frequency converter coupled to said first frequency generator;

a transmitting branch with an in-phase component and a quadrature component, said transmitting branch having a second frequency converter switchably coupled to one of said first and second frequency generators through said switch; and

a control device coupled to said switch and being programmed to select at least one of a transmitting mode of operation and a receiving mode of operation.